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Necessity and universality were the two characteristics which Kant was fond of pointing to as marking the essence of an *a priori* judgment. Will we do violence to his thought if we put his formula in another way? Can the outcome of the experiment be predicted before the experiment is made? and, can any experiment be imagined which would force us to revise our prediction? If the matter were put so our criterion would border perilously on the subjective. What meaning then are we to find in the *a priori* of Kant and still leave a place for Kantian freedom? This brings us to our conclusion. An *a priori* judgment is one whose truth can not be made an experimental issue. Here there is standing-room for absolutist and humanist alike. Their quarrel will hinge upon what one means when he speaks of the impossibility of empirical verification. A philosophy which conceives truth as if it were a static whole will be apt to make this impossibility absolute. But a philosopher, who views the world dynamically, will find that the denotation of this class of judgment is contingent on a thousand issues, each one relative to itself and to the others.

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REVIEWS AND ABSTRACTS OF LITERATURE

Behavior: An Introduction to Comparative Psychology. J. B. WATSON. New York: Henry Holt and Company. 1914. Pp. xii + 439.

The traditional view that psychology is the science of consciousness, or the more extreme view that it has only to do with "clear consciousness," has been found to be inadequate by numerous persons who have a practical interest in human beings and, as they think, in human minds. Neither education, industry, business, nor medicine finds much of concrete value in the psychology of a recondite awareness available only to its possessor. All of these practical disciplines have, therefore, insisted on a new statement of mental facts, a statement which deals with the phenomena of mental life as objective facts of the same general sort as those with which the anatomist and physiologist have to deal. Memory must be as open to objective study as is circulation, and the mechanisms of association no more inscrutable than the mechanics of digestion.

The revolt of educational, medical, and other forms of applied psychology has been powerfully strengthened in recent years by the growing interest in animal psychology which also could not exist if psychology were only about consciousness and its only method that of introspection. Professor Watson's book on "Behavior" presents the case of the revolt from the animal psychologist's point of view. It is virtually a declaration of independence with a statement of the reasons therefor.

In the opening chapter on psychology and behavior, the author attempts to show that "human psychology has failed to make good its claim as a natural science." He defines psychology as a "purely objective experimental branch of natural science," and draws certain conclusions as to elimination of certain "pseudo-problems" from the realm of psychological discussion. The image he finds to be admittedly nothing more than a centrally aroused process and then contends that "there are no centrally aroused processes" (p. 18). "They are probably in most cases kinesthetic substitutes for imagery" (p. 18). Affection is brought under the behaviorist's programme by being definitely connected with the sex organs and erogenous zones.

Chapter II. gives an overview of the field of behavior under the following heads: (I.) Sense organ functions; (II.) instinctive functions; (III.) habit formations; (IV.) correlation. Then follows a discussion in Chapter III. of apparatus and methods of study. Here is brought together material from widely scattered sources upon ways of studying animal problems. Illustrations of apparatus are shown and details of method are discussed. Chapters IV. and V. review the literature on instinct and related activities and give the current biological account of the origin of inherited behavior.

The mid-portion of the book, Chapters VI. to X., deals with problems in habit formation. The author, in common with other writers, reduces all behavior to two classes—instinct and habit.

Instinct is "a combination of congenital responses unfolding serially under appropriate stimulation . . . a series of concatenated reflexes," the pattern and order being of "a strictly heritable character." Habit differs from instinct only in the fact that "the pattern (number and localization of simple reflex arcs involved) and the *order* (temporal relations) are "acquired during the lifetime of the individual animal." The most difficult problem which this conception sets is that of showing how "concatenated reflexes" of "a strictly heritable character" can be altered in pattern and order. For this resolution of inherited behavior into new patterns and orders, Watson relies upon "the principle of frequency" and "the principle of recency," and rejects Thorndike's idea of the "law of effect" with its corollaries of "satisfiers and annoyers."

The author's argument, although backed up by a somewhat ingenious symbolism, is not convincing. He develops the theory with motor habits and in doing so neglects to deal with the whole chain of reflexes which have their origin in a sensory situation. An "inherited series" of "concatenated reflexes" initiated by a sensory stimulation do not change their order of functioning except when the exciting situation is altered, *i. e.,* if the sequence of acts is S, 1, 2, 3, 4, 5, 6, 7, 8, 9, *10* at one time, and at another is S, 2, 3, 4, 5, 6, 7, 8, 9, *10,* and at another is S-13-14-15-*10,* it is not by accident that the sequence varies. Either the environing situation has altered or the metabolic processes in the organism have changed or the activity of the organism has produced changes in itself. With the situation remaining constant, the metabolic processes remaining constant and the animal active, it would seem that the latter is the determining factor. Just how the effect is produced may not be clear. That, of course, is the thing to be explained, and Mr. Watson does not escape responsibility for such explanation by ignoring the problem.

The four chapters at the close of the book detail the results of experimental studies in vision, hearing, and other sensory functions, and it is probably in these chapters that the author is most acceptable. His intimate knowledge of experimental method and literature, and freedom from controversy, give these chapters a quality not found in the other portions of the book. In his discussion of the work on higher animals he is far from satisfactory either in his report of experimental work or in his interpretation. Out of a little more than five pages devoted to imitation in primates, two and a half are given to the discussion of his own pseudo-experiments on monkeys. The reason for this is apparently the author's unwillingness to accept the idea that animals learn by imitation. The right to insist upon his doctrine is, of course, admitted, but to telescope and misstate the work of other experimentalists in so doing is to forsake the rôle of scientist for that of the advocate.

On the side of presenting and interpreting details of behavior, Professor Watson's book will prove much more acceptable than in the extreme statement of the behavior theory which it contains. In the first field it clearly supersedes all other books now available and will doubtless become the accepted text for advanced courses in animal psychology. On its theoretic side, it will fall far short of general acceptance as the author doubtless anticipated it would. There is need of a revision of psychological theory. It is difficult to see how the science can grow if there is not some relief from the logical absurdities of parallelism, privacy of mind, and other impossible presuppositions. Few, however, will go to the extreme of saying that "psychology must discard all reference to consciousness" or that the psychologist is "never to use the terms consciousness, mental states, mind, content, will, imagery, and the like." One may accept the statement that psychology may be written "in terms of stimulus and response, in terms of habit formation, habit integration, and the like," but urge that one of "the responses" to be considered is the knowledge which one gets about his own acts which no one else ever gets, the response of awareness of one's own experiences. Conceivably, these states of awareness might be studied directly through observation of neural activity. To date, there is no hint of the experimental technique for such direct observation. In the absence of such means, it seems the merest folly to refuse consideration of such knowledge as introspection does give. The reviewer is willing to admit that introspective data lack scientific reliability and are in no sense the final data of psychology. That they are experiential facts seems, however, indisputable. It is also perfectly certain that they can be used to guide experimentation, and in this capacity they become of great scientific importance. We are hardly, therefore, ready to cast them aside as of no value. They are, at least, as valuable as color discrimination apparatus and other experimental devices.

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